```
                      10        20        30        40        50        60
HNCDNA.SEQ   ACAGTCAGCCGCATGGCTCCCCTGTGCCCCAGCCCCTGGCTCCCTCTGTTGATCCCGGCC
             ::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
HN.SEQ       ACAGTCAGCCGCATGGCTCCCCTGTGCCCCAGCCCCTGGCTCCCTCTGTTGATCCCGGCC
OLD                   10        20        30        40        50        60

                      70        80        90       100       110       120
HNCDNA.SEQ   CCTGCTCCAGGCCTCACTGTGCAACTGCTGCTGTCACTGCTGCTTCTGATGCCTGTCCAT
             ::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
HN.SEQ       CCTGCTCCAGGCCTCACTGTGCAACTGCTGCTGTCACTGCTGCTTCTGATGCCTGTCCAT
                      70        80        90       100       110       120

                     130       140       150       160       170       180
HNCDNA.SEQ   CCCCAGAGGTTGCCCCGGATGCAGGAGGATTCCCCCTTGGGAGGAGGCTCTTCTGGGGAA
             ::::::::::::::::::::::::::::::::::::::::::: :::::::::::::::::::::
HN.SEQ       CCCCAGAGGTTGCCCCGGATGCAGGAGGATTCCCCCTT-GGAGGAGGCTCTTCTGGGGAA
                     130       140       150       160       170

                     190       200       210       220       230       240
HNCDNA.SEQ   GATGACCCACTGGGCGAGGAGGATCTGCCCAGTGAAGAGGATTCACCCAGAGAGGAGGAT
             ::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
HN.SEQ       GATGACCCACTGGGCGAGGAGGATCTGCCCAGTGAAGAGGATTCACCCAGAGAGGAGGAT
                 180       190       200       210       220       230

                     250       260       270       280       290       300
HNCDNA.SEQ   CCACCCGGAGAGGAGGATCTACCTGGAGAGGAGGATCTACCTGGAGAGGAGGATCTACCT
             ::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
HN.SEQ       CCACCCGGAGAGGAGGATCTACCTGGAGAGGAGGATCTACCTGGAGAGGAGGATCTACCT
                 240       250       260       270       280       290

                     310       320       330       340       350
HNCDNA.SEQ   GAAGTTAA-GCCTAAATCAGAAGAAGAGGGCTCCCTGAAGTTAGAGGATCTACCTACTGT
             ::::::::  ::::::::::::::::::::::::::::::::::::::::::::::::::::::
HN.SEQ       GAAGTTAATGCCTAAATCAGAAGAAGAGGGCTCCCTGAAGTTAGAGGATCTACCTACTGT
                 300       310       320       330       340       350

                     360       370       380       390       400       410
HNCDNA.SEQ   TGAGGCTCCTGGAGATCCTCAAGAACCCCAGAATAATGCCCACAGGGACAAAGAAGGGGA
             ::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
HN.SEQ       TGAGGCTCCTGGAGATCCTCAAGAACCCCAGAATAATGCCCACAGGGACAAAGAAGGGGA
                 360       370       380       390       400       410

                     420       430       440       450       460       470
HNCDNA.SEQ   TGACCAGAGTCATTGGCGCTATGGAGGCGACCCGCCCTGGCCCCGGGTGTCCCCAGCCTG
             ::::::::::::::::::::::::::::::::::::::::  ::::::::::::::::::::::
HN.SEQ       TGACCAGAGTCATTGGCGCTATGGAGGCGACCCG-CCTGGCCCCGGGTGTCCCCAGCCTG
                 420       430       440       450       460       470

                     480       490       500       510       520       530
HNCDNA.SEQ   CGCGGGCCGCTTCCAGTCCCCGGTGGATATCCGCCCCCAGCTCGCCGCCTTCTGCCCGGC
             ::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
HN.SEQ       CGCGGGCCGCTTCCAGTCCCCGGTGGATATCCGCCCCCAGCTCGCCGCCTTCTGCCCGGC
                 480       490       500       510       520       530

                     540       550       560       570       580       590
HNCDNA.SEQ   CCTGCGCCCCCTGGAACTCCTGGGCTTCCAGCTCCCGCCGCTCCCAGAACTGCGCCTGCG
             ::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
HN.SEQ       CCTGCGCCCCCTGGAACTCCTGGGCTTCCAGCTCCCGCCGCTCCCAGAACTGCGCCTGC-
                 540       550       560       570       580       590
```

A P P E N D I X   1

```
              600        610        620        630        640        650
HNCDNA.SEQ    QAACAATGGCCACAGTGTGCAACTGACCCTGCCTCCTGGGCTAGAGATGGCTCTGGGTCC
              ::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
HN.SEQ        AGACAATGGCCACAGTGTGCAACTGACCCTGCCTCCTGGGCTAGAGATGGCTCTGGGTCC
              600        610        620        630        640        650

              660        670        680        690        700        710
HNCDNA.SEQ    CGGGCGGGAGTACCGGGCTCTGCAGCTGCATCTGCACTGGGGGGCTGCAGGTCGTCCGGG
              :::::::::::::::: X:::::::::::::::::::::::::::::::::::::::::::::
HN.SEQ        CGGGCGGGAGTACC-GGCTCTGCAGCTGCATCTGCACTGGGGGGCTGCAGGTCGTCCGGG
              660        670        680        690        700        710

              720        730        740        750        760        770
HNCDNA.SEQ    CTCGGAGCACACTGTGGAAGGCCACCGTTTCCCTGCCGAGATCCACGTGGTTCACCTCAG
              ::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
HN.SEQ        CTCGGAGCACACTGTGGAAGGCCACCGTTTCCCTGCCGAGATCCACGTGGTTCACCTCAG
              720        730        740        750        760        770

              780        790        800        810        820        830
HNCDNA.SEQ    CACCGCCTTTGCCAGAGTTGACGAGGCCTTGGGGCGCCCGGGAGGCCTGGCCGTGTTGGC
              ::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
HN.SEQ        CACCGCCTTTGCCAGAGTTGACGAGGCCTTGGGGCGCCCGGGAGGCCTGGCCGTGTTGG-
              780        790        800        810        820        830

              84U        850        860        870        880        890
HNCDNA.SEQ    CGCCTTTCTGGAGGAGGGCCCGGAAGAAAACAGTG-CCTATGAGCAGTTGCTGTCTCGCT
              ::::::::::::::::::::::::::::::::::::: ::::::::::::::::::::::::
HN.SEQ        CGCCTTTCTGGAGGAGGGCCCGGAAGAAAACAGTGTCCTATGAGCAGTTGCTGTCTCGCT
              840        850        860        870        880        890

              900        910        920        930        940        950
HNCDNA.SEQ    TGGAAGAAATCGCTGAGGAAGGCTCAGAGACTCAGGTCCCAGGACTGGACATATCTGCAC
              ::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
HN.SEQ        TGGAAGAAATCGCTGAGGAAGGCTCAGAGACTCAGGTCCCAGGACTGGACATATCTGCAC
              900        910        920        930        940        950

              960        970        980        990        1000       1010
HNCDNA.SEQ    TCCTGCCCTCTGACTTCAGCCGCTACTTCCAATATGAGGGGTCTCTGACTACACCGCCCT
              ::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
HN.SEQ        TCCTGCCCTCTGACTTCAGCCGCTACTTCCAATATGAGGGGTCTCTGACTACACCGCCCT
              960        970        980        990        1000       1010

              1020       1030       1040       1050       1060       1070
HNCDNA.SEQ    GTGCCCAGGGTGTCATCTGGACTGTGTTTAACCAGACAGTGATGCTGAGTGCTAAGCAGC
              ::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
HN.SEQ        GTGCCCAGGGTGTCATCTGGACTGTGTTTAACCAGACAGTGATGCTGAGTGCTAAGCAGC
              1020       1030       1040       1050       1060       1070

              1080       1090       1100       1110       1120       1130
HNCDNA.SEQ    TCCACACCCTCTCTGACACCCTGTGGGGACCTGGTGACTCTCGGCTACAGCTGAACTTCC
              ::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
HN.SEQ        TCCACACCCTCTCTGACACCCTGTGGGGACCTGGTGACTCTCGGCTACAGCTGAACTTCC
              1080       1090       1100       1110       1120       1130

              1140       1150       1160       1170       1180       1190
HNCDNA.SEQ    GAGCGACGCAGCCTTTGAATGGGCGAGTGATTGAGGCCTCCTTCCCTGCTGGAGTGGACA
              ::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
HN.SEQ        GAGCGACGCAGCCTTTGAATGGGCGAGTGATTGAGGCCTCCTTCCCTGCTGGAGTGGACA
              1140       1150       1160       1170       1180       1190
```

```
            1200        1210        1220        1230        1240        1250
HNCDNA.SEQ  GCAGTCCTCGGGCTGCTGAGCCAGTCCAGCTGAATTCCTGCCTGGCTGCTGGTGACATCC
            ::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
HN.SEQ      GCAGTCCTCGGGCTGCTGAGCCAGTCCAGCTGAATTCCTGCCTGGCTGCTGGTGACATCC
            1200        1210        1220        1230        1240        1250

            1260        1270        1280        1290        1300        1310
HNCDNA.SEQ  TAGCCCTGGTTTTTGGCCTCCTTTTTGCTGTCACCAGCGTCGCGTTCCTTGTGCAGATGA
            ::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
HN.SEQ      TAGCCCTGGTTTTTGGCCTCCTTTTTGCTGTCACCAGCGTCGCGTTCCTTGTGCAGATGA
            1260        1270        1280        1290        1300        1310

            1320        1330        1340        1350        1360        1370
HNCDNA.SEQ  GAAGGCAGCACAGAAGGGGAACCAAAGGGGGTGTGAGC→TACCGCCCAGCAGAGGTAGCC
            :::::::::::::::::::::::::::::::::::::::: ::::::::::::::::::::::
HN.SEQ      GAAGGCAGCACAGAAGGGGAACCAAAGGGGGTGTGAGCGTACCGCCCAGCAGAGGTAGCC
            1320        1330        1340        1350        1360        1370

            1380        1390        1400        1410        1420        1430
HNCDNA.SEQ  GAGACTGGAGCCTAGAGGCTGGATCTTGGAGAATGTGAGAAGCCAGCCAGAGGCATCTGA
            ::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
HN.SEQ      GAGACTGGAGCCTAGAGGCTGGATCTTGGAGAATGTGAGAAGCCAGCCAGAGGCATCTGA
            1380        1390        1400        1410        1420        1430

            1440        1450        1460        1470        1480        1490
HNCDNA.SEQ  GGGGGAGCCGGTAACTGTCCTGTCCTGCTCATTATGCCACTTCCTTTTAACTGCCAAGAA
            ::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
HN.SEQ      GGGGGAGCCGGTAACTGTCCTGTCCTGCTCATTATGCCACTTCCTTTTAACTGCCAAGAA
            1440        1450        1460        1470        1480        1490

            1500        1510        1520
HNCDNA.SEQ  ATTTTTTAAAATAAATATTTATAAT
            :::::v^:::::::::::::::::::
HN.SEQ      ATTTTTTAAAATAAATATTTATAAT
            1500        1510        1520
```